Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of	)	
	)	
Amendment of Parts 1, 2, 22, 24, 27, 90 and 95 of the Commission's Rules to Improve Wireless Coverage Through the Use of Signal Boosters	)	WT Docket No. 10-4

COMMENTS

July 25, 2011

1333 H Street
Suite 700 West
Washington, DC 20005
(202) 452-7823

wcainternational
WIRELESS COMMUNICATIONS ASSOCIATION

I. INTRODUCTION

The Wireless Communications Association International, Inc. ("WCAI"), the trade association of the wireless broadband industry, submits these comments in response to the Commission's Notice of Proposed Rulemaking regarding the adoption of a license-by-rule framework for signal boosters.

II. DISCUSSION

A. Settled Law and Policy Prohibits the Use of Signal Boosters without Licensee Consent.

The primary purpose of the Communications Act is to "maintain the control of the United States over all the channels of radio transmission."[1] The primary way in which the Act maintains that control is through a licensing regime. Specifically, the Communications Act requires that the Commission issue a license for the transmission of radio signals.[2] Once this license has been granted, the licensee is entrusted with the responsibility of securing compliance with the rules of the Commission.[3] To secure such compliance, licensees have the authority to control the devices used within the ambit of their spectrum licenses.[4] Although end users can operate transmitters within licensed spectrum, permission for such use is derived from the authorization held by the

---

[1] 47 U.S.C. § 301("No person shall use or operate any apparatus for the transmission of energy or communications or signals by radio… except under and in accordance with this Act and with a license in that behalf granted under the provisions of this Act").

[2] *Id*.

[3] 47 C.F.R. § 22.305 ("Station licensees are responsible for the proper operation and maintenance of their stations, and for compliance with FCC rules").

[4] 47 C.F.R. § 22.927 ("Cellular system licensees are responsible for exercising effective operational control over mobile stations receiving service through their cellular systems").

licensee providing the service,[5] who has blanket authority to permit the operation of transmitters within their assigned spectrum.[6]

The Commission's proposal to allow end user operation of signal boosters[7] without licensee consent and control would contradict the statutory scheme by effectively shifting control of transmitters from licensees to end-users. This transfer of control would eliminate the ability of licensees to ensure that the use of exclusively licensed spectrum complies with the rules of the Commission.[8] This result would be inconsistent with the statutory scheme and established policy.

i. The Commission Lacks Authority to License by Rule the Operation of Signal Boosters by End Users.

The Commission proposes to avoid the statutory scheme's licensing requirements by licensing signal boosters as a new "service[] by rule under Section 307."[9] That section provides that, "[n]otwithstanding any license requirement established in this Act, if the Commission determines that such authorization serves the public interest,convenience, and necessity, the Commission may by rule authorize the operation of radio stations without individual licenses" in certain enumerated "radio services," including the "citizens band radio service."[10] That section

[5] 47 C.F.R. § 1.903(c) ("Authority for subscribers to operate mobile or fixed stations… is included in the authorization held by the licensee providing service to them"); 47 C.F.R. § 22.3(b) (same).

[6] 47 C.F.R. § 22.165 ("A *licensee* may operate additional transmitters at additional locations on the same channel or channel block as its existing system without obtaining prior Commission approval") (emphasis added).

[7] The use of the term "signal booster" in these comments is intended to be consistent with the Commission's definition, which includes "all manner of amplifiers, repeaters, boosters, distributed antenna systems, and in-building radiation systems that serve to amplify CMRS device signals, Part 90 device signals, or extend the coverage area of CMRS providers or Part 90 service licensees." *Petitions Regarding the Use of Signal Boosters and Other Signal Amplification Techniques Used with Wireless Services*, Public Notice at n.1, DA 10-4, WT Docket No. 10-4 (Jan. 6, 2010) ("Public Notice").

[8] *See* 47 C.F.R. § 22.305.

[9] NPRM at para. 30.

[10] 47 U.S.C. 307(e)(1).

further provides that the term citizens band radio service shall have the meaning given it by the Commission by rule."[11] The Commission would read this exception broadly to include any new service the Commission desires. That reading would be inconsistent with the rules of statutory construction, which provide that statutory exceptions should be strictly construed lest the exception swallow the rule.[12] The Commission's reading would swallow the rule whole leaving nothing but Jonah's bones.

A strict construction of the exception would limit it to those services the Commission had already defined as citizen's band radio when the statute was enacted – a category that clearly does not include signal boosters. A more relaxed interpretation would provide the Commission with authority to designate new citizen's band radio services, but only if they are substantially similar to those citizen's band radio services that existed when the statute was enacted. Any broader reading would enable the Commission to ignore the general rule requiring licensing and upend the statutory scheme.

The use of signal boosters without licensee consent is substantially *different* than the current citizen's band radio services, such as the Wireless Telemetry Radio Service (WMTS), Family Radio Service (FRS), and Multi-Use Radio Service (MURS).[13] The services currently authorized under Part 95 are very limited with regard to their operation. As stated by the Commission, these services "provide short-range, low power radio for personal communications, radio signaling, and business communications *not provided for in other wireless*

[11] 47 U.S.C. 307(e)(3).

[12] See 82 C.J.S. Statutes § 371.

[13] 47 U.S.C. § 95.401. Low Power Radio Service (LPRS), Medical Device Radiocommunication Service (MedRadio), and Dedicated Short-Range Communications Service On-Board Units (DSRCS-OBUs) are also included in the definition of "citizens band radio service".

services."[14] These services are subject to stringent restrictions designed to limit their potential for interference, including low transmit power,[15] usage limitations,[16] and eligibility restrictions.[17] As a result of these restrictions, current citizen's band radio services do not present a substantial risk of harmful interference to other spectrum users. As discussed below, however, signal boosters already have caused harmful interference to licensed communications systems and are likely to do so even if authorized pursuant to the Commission's proposal in the NPRM. Moreover, in contrast to the intent underlying existing citizen's band radio services, a new signal boosters service would not meet an otherwise unmet communications need, because signal boosters are already available through licensee consent. Including signal boosters within the definition of "citizens band radio service" would therefore extend the classification well beyond the parameters to which the other services adhere.

ii. Manufacturers Lack Incentives to Comply with the Commission's Rules and Prevent Harmful Interference to Licensed Networks.

There are very good reasons why the statutory licensing regime entrusts licensees with the responsibility of securing compliance with the rules of the Commission. Because licensees have something valuable to lose (their licenses), they have strong incentives to comply with the Commission's rules. They also have strong economic incentives to avoid harmful interference to their own systems and the systems of other licensees. These incentives promote rules compliance and good stewardship of the spectrum. The Commission's ability to revoke a

---

[14] FCC, "Personal Radio Services," at http://wireless.fcc.gov/services/index.htm?job=service_home&id=personal_radio (emphasis added).

[15] *See, e.g.*, 47 C.F.R. § 95.635 (limiting the power output of MURS transmitters to 2 watts).

[16] *See, e.g.*, 47 C.F.R. § 95.1009(a)-(c) (Permissible communications for LPRS include auditory assistance, language translation, health care related communications and law enforcement tracking).

[17] *See, e.g.*, 47 C.F.R. § 95.1105 (allowing only authorized health care providers to operate transmitters in the WMTS, or manufacturers of the devices solely for purposes of demonstrating, installing, or maintaining the equipment for authorized health care providers).

spectrum license also provides the Commission with a strong and readily available enforcement mechanism in the event a licensee nevertheless does violate the Commission's rules.

Manufacturers and retailers of signal boosters, however, lack incentives to comply with the Commission's rules. The Commission's enforcement powers are significantly weaker vis-à-vis manufacturers and retailers: additional procedural steps are required (i.e., a citation) to pursue enforcement action against a non-licensee and the potential forfeiture amounts are significantly lower for non-licensees.[18] These potential enforcement issues are compounded in international cases involving the extraterritorial application of U.S. law to non-U.S. manufacturers. Given these barriers to enforcement, manufacturers and retailers lack significant incentives to comply with the Commission's rules.

Manufacturers and retailers also lack incentives to avoid harmful interference to mobile networks. If a manufacturer's signal booster causes interference to a licensee's mobile network, it is the licensee who will bear the costs of consumer dissatisfaction, not the manufacturer of the signal booster. To the contrary, signal booster interference may actually lead to more signal booster sales, as customers who lose service look for self-help remedies to their signal loss issues (even though it was a signal booster that caused the problem).

Given this reality, it should be unsurprising that manufacturers and retailers of signal boosters have systemically disregarded the law while marketing their products. Despite the fact that their products are currently illegal unless operated pursuant to licensee consent, the record reveals multiple instances of misleading statements made by manufacturers and retailers in their marketing materials and on their websites regarding the legitimacy of their devices.[19] Some websites simply assert that no authorization is required to install or use signal boosters.[20]

---

[18] See 47 U.S.C. sec. 503.

[19] *Id*.

[20] *See, e.g.*, Digital Antenna, Inc., "Frequently Asked Questions," http://www.wpsantennas.com/digital-antenna-faq.aspx, on which the FAQ page contained an

Other sites claim that their products are "FCC-approved"[21] or "certified by carriers."[22] These sites use the type-certification process to create an aura of legality for unauthorized use of the device in licensed spectrum. This type of marketing is expressly prohibited,[23] but has nevertheless been widely used by manufacturers and retailers to sell illegal signal boosters to unsuspecting consumers.

Adoption of a license-by-rule framework is not likely to enhance compliance with rules governing the sale and manufacture of signal boosters. As evidenced by their current behavior, manufacturers and retailers have already decided that any incentives they may have to comply with the rules of the Commission are outweighed by the potential for increased sales of their

---

entire section devoted to "FCC and Cellular Carriers," which has been removed (though it is still available at: http://web.archive.org/web/20060517130547/www.digitalantenna.com/faq.html). ("Q: Does the owner of this equipment (installed location) require an FCC license to operate the repeater? A: No, neither the user nor the installer needs an FCC license. All of our products are FCC approved... Q: Although the carriers own the frequencies that they operate on, are they permitting others to do the same with the repeaters? A: The cell phone, which is paid for by the customer, is transmitting on the specified frequency, not the repeater. The repeater is simply improving the signals. The repeater amplifies on the signal of the cell phone that is authorized to be used at the specific frequency").

[21] *See, e.g.*, Cell-phone Mate, "Company Information" http://www.cellphone-mate.net/about.html; [21] Repeater Store, "FCC Approval," http://www.repeaterstore.com/legal-notice.html, ("All active amplifying (repeater) products sold on this websites are licensed to operate on their appropriate bands by the Federal Communications Commission (FCC). Details of these licenses can be found on the FCC website, under the "Grantee Code" UM8. Repeaters are approved under the Equipment class of "Licensed on-Broadcast Station Transmitters"); *See also* Unwired Signal, "Cell Phone Booster & Cell Phone Repeater FAQ," http://www.unwiredsignal.com/?view=Cell-Phone-Booster-Repeater-FAQ. (While the webpages of Wilson Electronics that contained deceptive content have been removed, some retailers of their signal boosters continue to specifically advertise the legality of Wilson's devices: "Q: Are cellular repeaters legal? A: Wilson's are and their's is [sic] the only brand we carry. Legal and FCC approved.").

[22] *See, e.g.*, Spotwave Wireless, "What do we mean by Carrier-Approved?" http://www.spotwave.com/commercial/learning/carrier_approved.asp (claiming that the carry "the only out-of-the-box solution certified by carriers across North America")

[23] 47 C.F.R. § 2.927(c) ("No person shall, in any advertising matter, brochure, etc., use or make reference to an equipment authorization in a deceptive or misleading manner or convey the impression that such equipment authorization reflects more than a Commission determination that the device or product has been shown to be capable of compliance with the applicable technical standards of the Commission's Rules.")

devices. Presumptive authorization for a certain class of these devices would actually facilitate this business model, as unauthorized devices may more easily be sold without detection once authorized boosters are on the market. Additionally, if a license-by-rule regulation were passed, consumers may arrive at the understanding that signal boosters are generally allowed, but still fail to grasp that any device not prominently displaying the proposed label may not be legally employed.

iii. A Consumer-Focused Approach to Compliance Is Impractical.

A consumer-focused approach to managing signal boosters is even less likely to produce satisfactory results. The lack of incentives for compliance and the enforcement problems noted above are equally applicable to consumers. Indeed, consumers have even less incentive to worry about compliance with the Commission's rules, and enforcement actions against consumers are even more impractical than enforcement actions against manufacturers and retailers.

When it comes to consumers, consumer awareness is a significant issue. The fact that so many devices have been sold illegally provides evidence that many consumers are unaware of the legal restrictions regarding the use of signal boosters.[24] Clear and conspicuous labels can help,[25] but it is unlikely that the warnings proposed in the NPRM would be sufficient to ensure consumer compliance with the Commission's rules. The proposed label merely states that the devices must "be operated consistent with Part 95 Subpart M" and must be used on "a secondary non-interference basis."[26] But a warning label encouraging consumers to do significant research

[24] *See* Wilson Electronics, Inc., Petition for Rulemaking, WT Docket No. 10-4, at 4 (filed Nov. 3, 2009) ("Wilson has sold more than two million amplifiers and antennas since 2001 - l50,000 amplifiers last year alone…").

[25] *See* NPRM at 42-44; *Ex Parte* Letter from Brian M. Josef, Director, Regulatory Affairs, CTIA, to Marlene Dortch, Secretary, Federal Communications Commission (filed June 3, 2010) at 3; Comments of WCAI, WT Docket No. 10-4 (filed Feb. 5, 2010) at 13-14; DAS Forum Petition for Rulemaking, (filed Oct. 23, 2009) ("DAS Forum Petition") at 5-7; Bird Technologies, Inc., Petition for Rulemaking, WT Docket No. 10-4 (filed Aug. 18, 2005) at 9 ("Bird Technologies Petition").

[26] NPRM at 43.

– especially when encountered at the point of purchase – would offer little more than window dressing. It would place an excessive burden on consumers to research, understand, and comply with a myriad of highly technical rules.[27]

Even if the label were more easily understood, it is unrealistic to assume that consumers would play a meaningful role in avoiding harmful interference. Consumers are likely to be unaware of the harms that may be caused by their use of signal boosters. Because they have no ability to "see" the network, consumers would likely have no knowledge of interference they may be causing or its effects on other users of the network.[28] Even well meaning consumers may buy noncompliant devices lacking labels, because those consumers may not know that a label is required, and less scrupulous consumers may nevertheless purchase non-compliant devices for reasons of performance or economics. For these same reasons, it is unrealistic to assume widespread compliance with the registration requirements proposed in the NPRM.[29]

---

[27] *See* NPRM at Appendix A, Proposed Revision of 47 C.F.R. § 95.1611(b) ("A signal booster can only be certificated and operated if it complies with all applicable rules in this subpart and all applicable technical rules for the frequency band(s) of operation including, but not limited to: § 22.355, Public Mobile Services, frequency tolerance; § 22.913, Cellular Radiotelephone Service effective radiated power limits; §22.917, Cellular Radiotelephone Service, emission limitations for cellular equipment; § 24.232, Broadband Personal Communications Service, power and antenna height limits; § 24.238, Broadband Personal Communications Service, emission limitations for Broadband PCS equipment; § 27.50, Miscellaneous Wireless Communications Services, power and antenna height limits; § 27.53, Miscellaneous Wireless Communications Services, emission limits; § 90.205, Private Land Mobile Radio Services, power and antenna height limits; § 90.210, Private Land Mobile Radio Services, emission masks; § 90.219, Private Land Mobile Radio Services, use of signal boosters; and § 90.247, Private Land Mobile Radio Services, mobile repeater stations").

[28] CTIA Comments at 28. *See also* Sprint Nextel Comments at 7-8 ("Consumers purchase these devices on the Internet or elsewhere and install them, with no knowledge of the adverse effect on commercial and public safety wireless networks").

[29] NPRM at 65.

B. The Use of Signal Boosters Results in Harmful Interference to Networks.

Signal boosters have an inherent tendency to cause interference to wireless networks,[30] and the damages inflicted by this interference have been extensively catalogued by the industry,[31] public safety officials,[32] and manufacturers alike.[33] For example, GPD Telecom, a manufacturer of signal boosters, notes that "the use of BDAs or similar amplification systems can and do cause destructive noise in the donor system."[34] Smart Booster likewise explains that "handset boosters can and do cause serious interference when deployed with impunity."[35] The

---

[30] *See* NPRM at 14-17.

[31] Comments of AT&T Inc., WT Docket No. 10-4 (filed Feb. 5, 2010) ("AT&T Comments"); Comments of CTIA—The Wireless Association, WT Docket No. 10-4, (filed Feb. 5, 2010) ("CTIA Comments"); Comments of Sprint Nextel, WT Docket No. 10-4, (filed Feb. 5, 2010) ("Sprint Nextel Comments"); Comments of United States Cellular Corporation, WT Docket No. 10-4, (filed Feb. 4, 2010) ("US Cellular Comments"); Comments of Verizon Wireless, WT Docket No. 10-4, (filed Feb. 4, 2010) ("Verizon Wireless Comments").

[32] Comments of the American Association of State Highway and Transportation Officials, WT Docket No. 10-4, at 3-4 (filed Feb. 5, 2010); Comments of the Association of Public-Safety Communications Officials-International, WT Docket No. 10-4, at 2-3 (filed Feb. 5, 2010); Comments of Patrick Becker, Glendale Fire Department, WT Docket No. 10-4, at 1 (filed Feb. 5, 2010); Comments of the King County, Washington Regional Communications Board, WT Docket No. 10-4, at 1-3 (filed Feb. 5, 2010); Comments of the National Emergency Number Association, WT Docket No. 10-4, at 1, 3-5 (filed Feb. 5, 2010); Comments of County of San Bernardino, WT Docket No. 10-4, at 1 (filed Feb. 5, 2010); Comments of Raymond Grimes, Sheriff-Coroner Department, County of Orange, California, WT Docket No. 10-14, at 1-2 (filed Feb. 4,2010) ("Orange County Comments"); Comments of Massachusetts State Police, WT Docket No. 10-4, at 1-2 (filed Feb. 4, 2010); Comments of City of Phoenix, WT Docket No. 10-4, at 1(filed Feb. 4, 2010); Comments of Phoenix Fire Department, WT Docket No. 10-4, at 1 (filed Feb. 4, 2010); Comments of David Clemons, City of Worcester, WT Docket No. 10-4, at 1 (filed Jan. 30, 2010); Comments of Gregory T. Bunting, St. Lucie County, WT Docket No. 10-4, at 1 (filed Jan. 20, 2010)("St. Lucie County Comments"); Comments of Cobb County, Georgia E- 911, WT Docket No. 10-4, at 1-2 (filed Jan. 19, 2010) ("Cobb County E-911 Comments"); Comments of Cpl. Jason Matthews, Lake County Sheriff's Office, WT Docket No. 10-4, at 1 (filed Jan. 15, 2010).

[33] Comments of Bird Technology Group, WT Docket No. 10-4, at 3-4 (filed Feb. 5, 2010) ("Bird Technology Comments"); Comments of Scott Alford for RF Industries, WT Docket No. 10- 4, at 4-8 (filed Feb. 5, 2010); Comments of GPD Telecom, WT Docket No. 10-4, at 1-2 (filed Feb. 3, 2010) ("GPD Comments"); Comments of Nextivity, WT Docket 10-4, at 2-5, 8 (filed Feb. 3, 2010); Comments of Smart Booster, WT Docket 10-4, at 3, 45, 52 (filed Feb. 4, 2010); ("Smart Booster Comments").

[34] GPD Comments at 1-2.

[35] Smart Booster Comments at 3.

interference that results from the use of signal boosters can cause serious harms to wireless networks.

This interference can degrade wireless service or may cause entire cell sites to be shut down.[36] For this reason, consumers may encounter dropped calls or extended loss of service.[37] It has been asserted that "[i]nterference to commercial networks harms consumers by increasing costs, decreasing quality, and consuming limited human and financial capital resources."[38]

Moreover, interference may have more hazardous effects as it can endanger the safety of the public, and the record is rife with examples of signal boosters hindering public safety services.[39] As commenters explain, "[i]nterference into first responder and critical infrastructure networks threatens safety-of-life missions by law enforcement and first responders and can jeopardize the monitoring, performance, and repair of electric, gas, water, sewer and other critical utilities."[40] Furthermore, as stated in the Comments of a public safety department, "[i]n our view, it is critical to Public Safety that these signal booster systems be of an approved design, installed by knowledgeable technical people, and registered with the licensee of the system for which it will serve. To allow less is an abdication of our duties to manage the airwaves in the public interest."[41] Because signal boosters pose such significant risks of harm to the functioning of society, adoption of the proposed rule would not serve the best interests of the public.

Interference from these devices has many causes, which makes it very difficult to prevent. For example, adjacent channel noise occurs when a signal booster is operating far from

---

[36] Verizon Comments at 6.

[37] AT&T Comments at 27.

[38] Sprint Nextel Comments at 8.

[39] *See supra* n.23.

[40] Sprint Nextel Comments at 8.

[41] St. Lucie County Comments at 1.

the base station with which it is trying to communicate, but close to a different carrier's base station, causing it to over-amplify its signals.[42] This "near-far" problem may be caused by virtue of the device being too powerful, or by the particular position of the signal booster, which is a constant issue with mobile signal boosters.[43] Oscillation, which often results from improper installation of signal boosters,[44] is caused by the external and internal antennas of the signal booster being positioned too near each other, leading the signal to reverberate at uncontrollably high levels which to which the network responds by increasing the power of all receivers served in that sector.[45] Both types of interference can significantly impair the networks and the service they provide to their customers.

To address the interference caused by signal boosters, the Commission has proposed implementing technical safeguard requirements, such as the obligation of the device to continuously self-monitor and shut down if interference is encountered.[46] These mechanisms alone, however, are not sufficient to adequately protect networks and consumers from the negative effects of these signal boosters.[47] Multiple incidents of interference have been reported despite the presence of such technology.[48] As Verizon points out, "[t]he fact that these features

---

[42] *See, e.g.*, NPRM at 15.

[43] *See, e.g.*, AT&T Comments at 26.

[44] *See, e.g.*, Sprint Nextel Comments at 4; Comments of Motorola, Inc., WT Docket No. 10-4, at 5 (filed Feb. 5, 2010) ("Motorola Comments").

[45] *See, e.g.*, NPRM at 16; AT&T Comments at 26.

[46] NPRM at 37.

[47] Reply Comments of AT&T, WT Docket No. 10-4, at 38-41(filed Mar. 8, 2010)("AT&T Reply Comments"); Sprint Nextel Comments at 7; Verizon Comments at 14-18; Motorola Comments at 4-5, US Cellular Comments at 2-3, CTIA Comments at 2-3; Jack Daniel Reply Comments, WT Docket N. 10-4, at 6-7 (filed Mar. 8, 2010) ("Jack Daniel Reply Comments").

[48] Verizon Comments at 7-8, 14-15 ("At least four of the interference incidents noted above were caused by Wilson BDAs employing 'Smart Tech' technology").

did not work to prevent interference in at least some incidents shows that device standards alone are not sufficient to prevent interference."[49]

Without control by wireless networks, harms caused by interference will continue to persist despite the imposition of technical safeguards. Commenters contend that "[w]hile a more rigorous FCC certification process and improved technology might complement licensee consent and control, certification by third parties and improved technologies offer inadequate interference protection and assurance of compatibility."[50] Consequently, the safeguards proposed by the Commission are simply not sufficient to protect networks and consumers from interference caused by signal boosters. It has been asserted that "[u]ltimately, the licensee is responsible for quality of service, network performance and the end user experience. The deployment of these devices without the direct involvement of the licensee impacts the performance of the network in ways in which the licensee cannot control, and consequently, service to end users is placed in jeopardy."[51] It is thus imperative that carriers have continuous control over the devices employed within their spectrum in order to ensure that they may provide an acceptable level of service to their consumers.

C. The Potential Benefits of Signal Boosters Are Far Outweighed by Their Costs.

The potential costs of signal boosters discussed above far outweigh their potential benefits. The Commission identifies certain urban areas that may need increased signals such as garages, tunnels, and inside buildings.[52] The Commission proposes to address these coverage gaps by clarifying the treatment of signal boosters under Part 90,[53] and aims to reduce the

[49] *Id* at 15.

[50] AT&T Comments at 40-41.

[51] Motorola Comments at 5.

[52] NPRM at 11.

[53] *See* NPRM at 74, 78, 81.

potential for harmful interference by allowing Class B fixed signal boosters only in these enclosed areas[54] pursuant to coordination with spectrum licensees.[55]

Because these coverage gaps in urban areas can be remedied by Part 90 devices coordinated with licensees, superior service coverage in these limited areas does not provide a compelling reason for giving consumers free reign to employ potentially harmful devices. Nevertheless, the proposed Part 95 signal booster rules would allow consumers to employ mobile broadband devices themselves without coordination.[56] The only additional protection required of Part 95 mobile boosters is that they must "power down or cease amplification as they approach the base station with which they are communicating."[57] But this requirement does not address the near-far problem, which causes adjacent channel noise, and as a result, will not remedy the potential for interference. It also ignores "[t]he basic point . . . that having too many boosters in the same area will inevitably have a negative impact on network performance, including dropped calls. If a carrier has to contend with large numbers of boosters not installed in cooperation with the carrier, operating at unknown locations in a given area, it rapidly becomes extremely difficult for the carrier to provide an acceptable level of service."[58] As a result, allowing consumers unfettered use of signal boosters would do more harm than good.

It has also been suggested that the use of signal boosters could be beneficial to public safety.[59] However, these accounts are offset by the numerous submissions by public safety

---

[54] NPRM Appendix A, Proposed 47 C.F.R. § 90.219.

[55] NPRM Appendix A, Proposed 47 C.F.R. § 95.1625.

[56] *Id*.

[57] NPRM Appendix A, Proposed 47 C.F.R. § 95.1623(c).

[58] US Cellular Comments at 3.

[59] *See, e.g.,* Orange County Comments at 1; Cobb County E-911 Comments at 1;*Ex Parte* Letter from Russell D. Lukas, Counsel to Wilson Electronics, Inc. to Marlene H. Dortch, Secretary, Federal Communications Commission (Dec. 15, 2010) at Attachment 1.

officials who delineate the harms that can arise when signal boosters are employed.[60] Public safety agencies operate Part 90 signal boosters with less threat of interference, due the design of these devices and coordination with the licensee.[61] However, the potential for interference presented by Part 95 signal boosters, particularly broadband mobile boosters, severely threatens public safety. For example, E-911 services often rely on signal strength determinations for identifying the location of the emergency, an ability that would be severely hindered by the use of signal boosters.[62] As a result, "more than simply disrupting routine wireless communications, wireless repeaters that are not controlled by carriers can adversely affect the public safety of wireless subscribers regardless of whether the repeater is operating as intended or if it is malfunctioning."[63]

Moreover, it has been asserted that "[w]hile signals booster are extremely valuable to public safety networks, improperly installed or maintained boosters, or the wrong class of booster, can create harmful interference to public safety and other radio communications systems. Many public safety agencies have been frustrated by interference from unauthorized signal boosters, and the difficulty of locating the interfering devices."[64] Additionally, commenters aver that "[p]ublic safety licensees in particular are experiencing a dramatic increase of such interference causing long term degradation or blockage of critical and

---

[60] *See supra* n.23.

[61] *See* Jack Daniel Reply Comments at 15, 16 ("Public safety grade signal boosters designed to meet the most demanding local and national codes are not the same as inexpensive signal boosters such as Wilson and others. These signal boosters also meet all FCC requirements;" "Public safety licensees have highly disciplined spectrum coordination within their blocks of frequencies").

[62] CTIA – The Wireless Association, White Paper on the Harmful Impacts of Unauthorized Wireless Repeaters at 13 (filed May 1, 2006) ("Network-based E911 location systems require precise calculations of field strength and signal timing in the network to accurately estimate the location of subscribers within the specified degree of accuracy").

[63] *Id*.

[64] Comments of Association of Public-Safety Communications Officials-International, Inc., WT Docket No. 10-4, at 2 (filed Feb. 5, 2010) ("APCO Comments").

potentially lifesaving communications on their wireless systems."[65] The harms caused public safety agencies by interference from signal boosters counteract the benefits which could be derived from their use, as this interference threatens the entire functioning of public safety services. As expressed by one provider of emergency services, signal boosters create a "Public Safety interference fire storm waiting to devour all in its path."[66] It is therefore evident that the harmful effects of signal boosters outweigh their potential benefits with regards to public safety.

It has been noted that residents of rural areas could benefit from the use of signal boosters.[67] While the lack of coverage in some rural areas is certainly an issue which needs to be addressed, authorizing a license-by-rule framework to do so would not be the appropriate solution. CMRS providers are aware of the coverage gaps that may exist in rural areas, and are striving to remedy the situation. "[W]ireless carriers understand the coverage limitations that wireless users may encounter in certain markets and areas of the country. To address this concern, AT&T and others in the wireless industry continue to invest heavily in network build-out and expansion and are developing other coverage solutions that do not harm network integrity."[68] These networks need to be allowed to continue to expand their coverage areas without sacrificing the quality of service offered to their customers, which would be threatened by the unfettered operation of signal boosters.

To contend with these issues in the interim, commenters have asserted that "[t]he wireless community supports the use of commercial-grade, professionally-installed, channelized

---

[65] Bird Technologies Petition at 6.

[66] Cobb County E-911 Comments at 2.

[67] *See, e.g.,* NPRM at 11; AT&T Reply Comments at 43.

[68] AT&T Reply Comments at 43. *See also Id* at 38 ("AT&T submits, however, that ongoing measures by wireless carriers – including substantial infrastructure investments to improve and expand wireless coverage, support for commercial-grad, professionally installed, channelized boosters and development and commercial offering of femtocell devices – offer better paths to improving wireless service").

boosters, so long as they receive licensee approval and are ultimately under licensee control."[69] These caveats to the grant of authorization by the carriers ensure that coverage can be improved without sacrificing the service they provide. As more suitable methods of enhancing coverage proliferate, signal gaps will continue to diminish, without introducing their own set of harms such as those that are imposed by signal boosters.

In sum, the detrimental effects of signal boosters clearly outweigh any benefits which could potentially be derived from their use, as the functioning of the networks used by all would be sacrificed for the benefit of a few. As explained by commenters, "[w]hile this practice may improve signal reception for the operator of the unauthorized equipment, it does so at the expense of surrounding users, who suffer reduced quality of service and impairment of access to the public safety benefits of commercial wireless service."[70] It has additionally been stated that "by their very nature, repeaters and signal boosters, regardless of the quality of their design and/or manufacture, trade a private benefit to a single user against the public harm to other users."[71] Furthermore, as averred by a public safety office, "it only takes one malfunctioning device to hamper communications for all."[72] The benefits that could potentially be gleaned from signal boosters do not offset the harms that are inherent in the use of these devices, regardless of any technical safeguards that may be imposed. For these reasons, the proposed rule should not be adopted by the Commission.

---

[69] *Id* at 45; *See also* Sprint Nextel Comments at 9 ("Sprint Nextel sells, services, and installs products that consumers can use to enhance their coverage and has a well-established program to allow third-party systems to operate on the network."); Verizon Comments at 18-19.

[70] CTIA Comments at 2.

[71] CTIA – The Wireless Association, Petition for Declaratory Ruling, WT Docket No. 10-4, at n.26 (filed Nov. 2, 2007).

[72] Cobb County E-911 Comments at 2.

D. If the Commission Licenses Signal Boosters by Rule, It Should Impose Stringent Technical Requirements.

WCAI strongly urges the Commission to abandon the proposed rule. However, if signal boosters become subject to a presumptive authorization, the FCC should implement the proposal set forth by AT&T in a recent ex parte, which contains a number of safeguards to mitigate the potential for interference as well as remedies should it occur.[73] Other proposals recognized in the NPRM[74] are not sufficient to adequately protect against the harms caused by interference.

For example, DAS Forum's proposal merely suggests imposing an industry code of conduct to which retailers and installers should conform, rather than specific regulations.[75] However, because there is ample evidence that both manufacturers and consumers have not been adhering to the regulations currently in place,[76] it is highly improbable that a code of conduct would spur compliance. Furthermore, the proposal places too much responsibility for the avoidance of interference on the consumer. DAS suggests that it should be the "responsibility of the owner or installer to coordinate with the appropriate local carrier(s) prior to operation in order to avoid harmful interference;"[77] however, it is not likely that this warning will provide sufficient motivation to the consumer to actually do so, especially given the fact that consumers are often under the misconception that these devices are simply "plug and play."[78] Without the carrier's ability to control the use of the device, interference will be encountered

---

[73] *Ex Parte* Letter from Jeanine Poltronieri, Assistant Vice President, External Affairs, AT&T Services, Inc., to Marlene Dortch, Secretary, Federal Communications Commission, WT Docket No. 10-4, at 7 (filed May 28, 2010)("AT&T May 28, 2010 *Ex Parte* Letter").

[74] NPRM at 58-60.

[75] DAS Forum Petition for Rulemaking, WT Docket No. 10-4, at 6-8 (filed Oct. 23, 2009)("DAS Forum Petition").

[76] *See supra* Section II.C.

[77] DAS Forum Petition at 6.

[78] *See* Sprint Nextel Comments at 7.

due to those consumers who do not comply with the obligations set forth in DAS Forum's proposal.

Wilson's proposal is likewise deficient, as it merely requires a number of safeguards to be present in the device, despite the fact that it has been shown that these safeguards are not sufficient to adequately protect the networks from interference.[79] Carrier oversight and authorization is necessary to ensure that interference caused by signal booster usage is avoided to the greatest extent possible. This position is supported by APCO, which states that "[t]he equipment certifications and voluntary industry standards [DAS Forum and Wilson] propose are insufficient to prevent the improper use of signal boosters and the potential for dangerous interference to public safety and other important communications networks."[80] CTIA's proposal, in contrast, does support carrier control of the devices, in addition to technical standards for signal boosters. However, AT&T's proposal provides a more comprehensive scope for preventing and redressing interference. It is for this reason that WCAI supports the proposal of AT&T should signal boosters become subject to presumptive authorization.

First, AT&T proposes that these devices be subject to a multi-step certification process.[81] While the booster must obtain type-certification,[82] additional review measures are necessary to certify that the device will be capable of operating without causing harm to the networks.[83] Devices must therefore be submitted to a certification process established by the industry before they may be marketed.[84] Once a booster has satisfied these initial requirements, the licensed

---

[79] *See supra* Section II.B.

[80] APCO Comments at 3.

[81] AT&T May 28, 2010 *Ex Parte* Letter at 8-9.

[82] *Id* at 9.

[83] *Id.*

[84] *Id.*

carrier must have the authority to ultimately approve the use of the device within its spectrum to ensure that it complies with the network's protocols.[85]

Once the carrier has authorized the activation of the device prior to its usage, it is imperative that spectrum licensees maintain control over the signal booster. To this end, the licensee must be able to identify, locate, and shut off the device if deemed necessary.[86] Furthermore, the transmit power of the booster must be controlled either by the licensee,[87] or autonomously by the device though the use of gain control functionality.[88] Additionally, the booster must be able to recognize oscillation and to stop transmitting if it occurs.[89] All of these requirements are necessary to avoid interference to the greatest extent possible.

Moreover, the booster's transmissions must be limited to the frequency which is licensed to the authorizing carrier.[90] This recommendation specifically seeks to prohibit broadband signal boosters which are not limited to a specific frequency, but rather operate throughout a broad range of spectrum, irrespective of the licensee.[91] Broadband boosters thus cause interference on the licensed spectrum of carriers other than the authorizing carrier, making it more considerably more difficult to remedy.

There must also be mechanisms available to ensure that these requirements are strictly followed and enforced.[92] In order to protect wireless networks and the consumers they serve, the Commission must make sure that actions are brought against any parties that market, sell, or

---

[85] *Id.*

[86] *Id.*

[87] *Id.*

[88] *Id* at n.32.

[89] *Id* at 8.

[90] *Id.*

[91] *Id*. *See also* AT&T Comments at 27.

[92] AT&T May 28, 2010 *Ex Parte* Letter at 9.

use any boosters which have not complied with the steps of the authorization process.[93] Additionally, the licensees, who are ultimately responsible for the compliance of any device which operates on their spectrum, must have the capability to swiftly and effectively bring actions against any party in violation, through an accelerated docket procedure.[94] This process is especially necessary given that the enforcement of the rules against interference is generally left to the licensees, as "carriers react to individual harmful interference incidents by locating the source of the interference."[95] An accelerated docket would thus enable carriers to address unauthorized devices in an efficient manner, to stop the manufacture, sale, and use of interfering devices before more harm is done to the network's service.

IV. CONCLUSION

For the foregoing reasons, WCAI urges the Commission to abandon the proposed rule in favor of more vigorous enforcement of the current rules pertaining to the unauthorized use of signal boosters.

Respectfully submitted,

Wireless Communications Association
International, Inc.

By: /s/ Fred Campbell

Fred B. Campbell, Jr.
President & CEO
1333 H Street, NW, Suite 700 West
Washington, DC 20005
202.452.7823

July 25, 2011

[93] *Id.*

[94] *Id* at 10; *See also* AT&T Comments at 35.

[95] AT&T Comments at 33.